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Various sizes of diamond-substitute disks (Type A) have been developed at the Moscow Grinding Plant (MZSh) for dressing grinding wheels. The disks are made from especially durable abrasive grains held together with a special bond. According to data of the Krasnyy proletariy Plant, A-24 disks last through 100-120 dressings. One loading of the disk holders is adequate for 3 weeks.

For dressing a grinding wheel, the disks are mounted on a special arbor secured in an attachment which is located on the table of the grinding machine.

Dressing of the grinding wheel is done by a rolling method. The disks, mounted on a free-turning arbor spindle, come into contact with the grinding wheel. The grinding wheel imparts motion to the disks in an opposite direction from its rotation. Because of the considerable friction between the rough surfaces of the grinding wheel and the disk, there is no slipping as the latter rolls around the surface of the wheel.

The cross feed of the arbor causes pressure of the disk grains on the working surface of the grinding wheel, and the longitudinal feed of the table, together with the attachment mounted on it, cuts into the grinding wheel, breaking its bond and causing the abrasive grains to fall. Some of the less durable grains of the wheel crack under this action. The loosened and cracked grains are ejected from the wheel by centrifugal force..

Setting up takes place in the following order: Disks are mounted on the spindle, followed by a washer and nut which secure the disks. The disks must fit loosely on the spindle but without end play. A cushion made of foil or cardboard, 0.5-0.7 millimeter thick, is used for eliminating play. It must be borne in mind that the disks are manufactured with a ceramic bond and under excessive tightening can break down. For this reason, it is recommended that a wrench with a shoulder of not more than 100 millimeters be used for tightening the nut.

To eliminate possible eccentricity, the disks go through a running-in after they are mounted on the arbor in the position in which they will be used for

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dressings the grinding wheel. Running in gets best results if it is done on a special grinding machine designed for this purpose. Running in takes place as follows: The disks are carefully rotated by means of a pencil or other wooden stick in a direction opposite to the rotating grinding wheel; the grinding wheel is brought into contact with the disk (at a point of the disk farthest from its axis); and the longitudinal feed of the table is started. After the disk stops, the longitudinal feed is cut off and the operation is repeated until all disks acquire a correct geometrical shape and their working surfaces are correctly disposed in relation to the axis of rotation. During the reversal of the longitudinal feed, care must be taken that one of the disks mounted on the arbor is in contact with the wheel at all times (this condition should also be watched during wheel dressing).

The arbor, together with the disks which have been run in, is mounted on an attachment which secures it to the table of the grinding machine.

If the width of the wheel is less than 75 millimeters, two disks are mounted on the arbor. If the width of the wheel is 75-150 millimeters, three disks are used.

It is recommended that dressing of a grinding wheel be carried out in the following order: Start the spindle of the grinding machine and bring the grinding wheel into contact with the disks; then start the flow of the coolant and the longitudinal table feed. (Dressing can be done with or without a coolant.) Cross feed is started as the disks approach the edge of the grinding wheel.

The arbor should be installed so that the axes of the grinding wheel and disks are parallel. In special cases, the disks can be mounted at an angle of not more than 3 degrees.

The conditions for dressing grinding wheels according to this method have not been thoroughly investigated. Preliminary data is given below:

<u>Cross Feed (mm)</u>	<u>Longitudinal Feed (m/min)</u>	<u>No of Passes</u>
0.05-0.06	1.2	2-3
0.02-0.03	1.2	1-2
Without cross feed	0.8	2

In those cases where workpieces require a high finish, the number of passes without cross feed must be increased and a fine-grain disk must be used. If the grinding wheel requires high productivity, the number of passes without cross feed must be decreased and the depth of feed during the first passes should be increased. Under these conditions, the degree of finish of the workpiece will be somewhat lower.

The MZSh diamond substitute disks are being used at the Kalibr, Krasnyy proletariy, and Serp i molot Plants.

For wider adoption of this type of disk, centralized production of arbors and attachments for securing them in grinding machines must be organized after determining the design of grinding machine best suited for this purpose.

The perfection of this process still requires a great deal of intensive study on the part of engineer-technologists and grinding-machine operators.

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